



Evaluating Effectiveness of Floodplain Reconnection Sites along the Lamoille Valley Rail Trail: A Blueprint for Future Rail-River Projects



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Introduction

Lowering of rail beds to restore floodplain connection (Figure 1) is a river restoration practice with great potential, but which must also consider the multiple uses and functions of river and rail corridors, along with the potential impacts and benefits to adjacent infrastructure, life safety and health, and the environment.



Figure 1. Example of rail bed lowered along Black Creek, Fairfield, VT.

Modeled Demonstration Site

Using a two-dimensional hydraulic model, the team is evaluating several alternatives for enhanced floodplain reconnection at a demonstration site on the Black Creek in East Fairfield (Figure 2) that seeks to restore 22 acres of floodplain by modifying up to 1,300 feet of embankment.

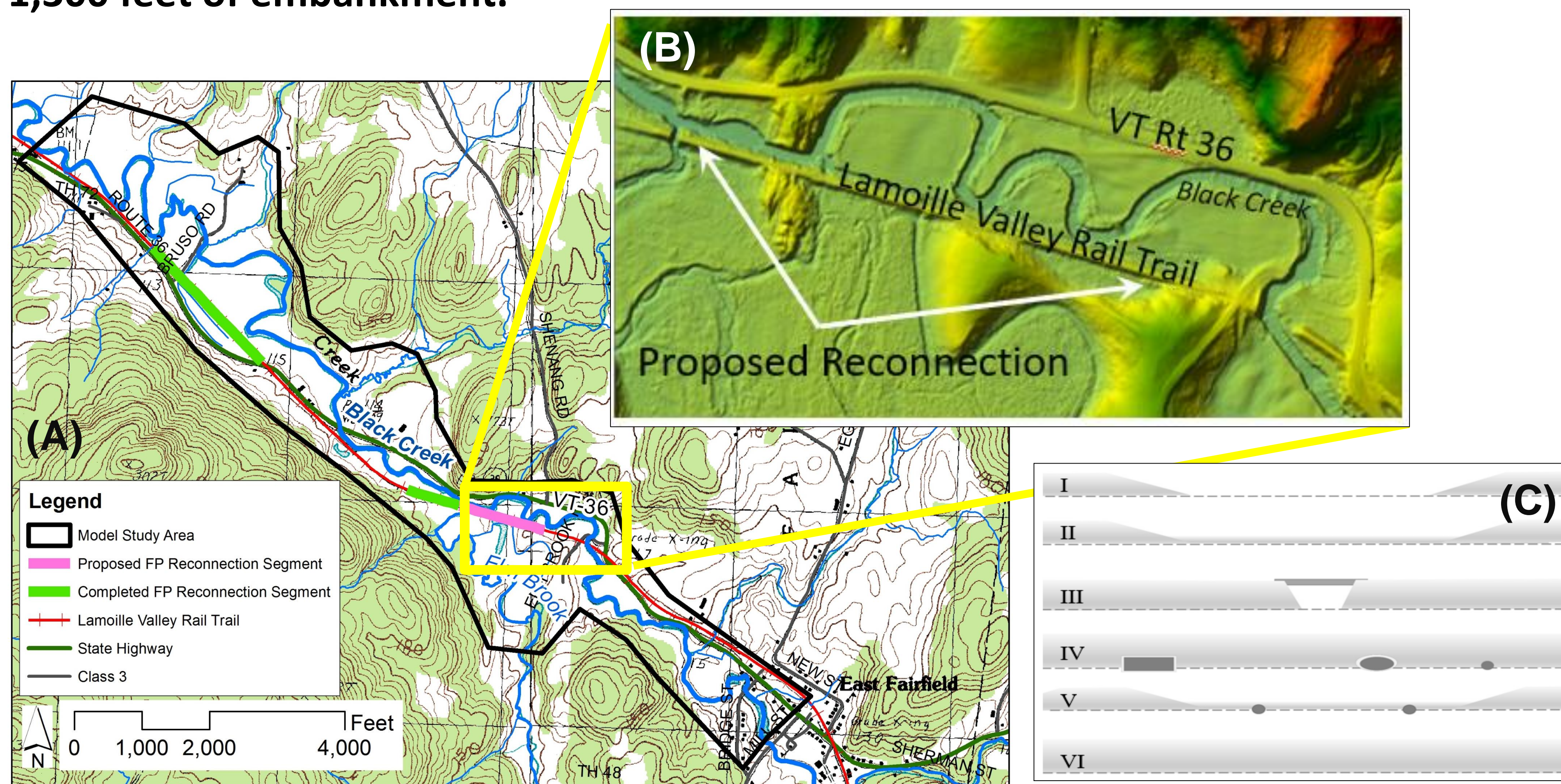


Figure 2. (A) Location of demonstration site along the Black Creek in East Fairfield; we will simulate (B) reconnection of a Lamoille Valley Rail Trail segment by (C) various alternatives including partial or total bed lowering, cross culverts or bridges, or a combination of both.

Channel Bathymetry

We have surveyed 147 channel cross sections along the 3-mile modeling extent (Figure 3) to better represent the topography of the river channel bottom (Figure 4), since terrestrial lidar does not penetrate the water surface.

Figure 3. Survey data were collected using EmlidTM real-time kinematic (RTK) global navigation satellite system receivers (A): one operated as a base station and wifi hotspot (B), the other as a roving unit (C).

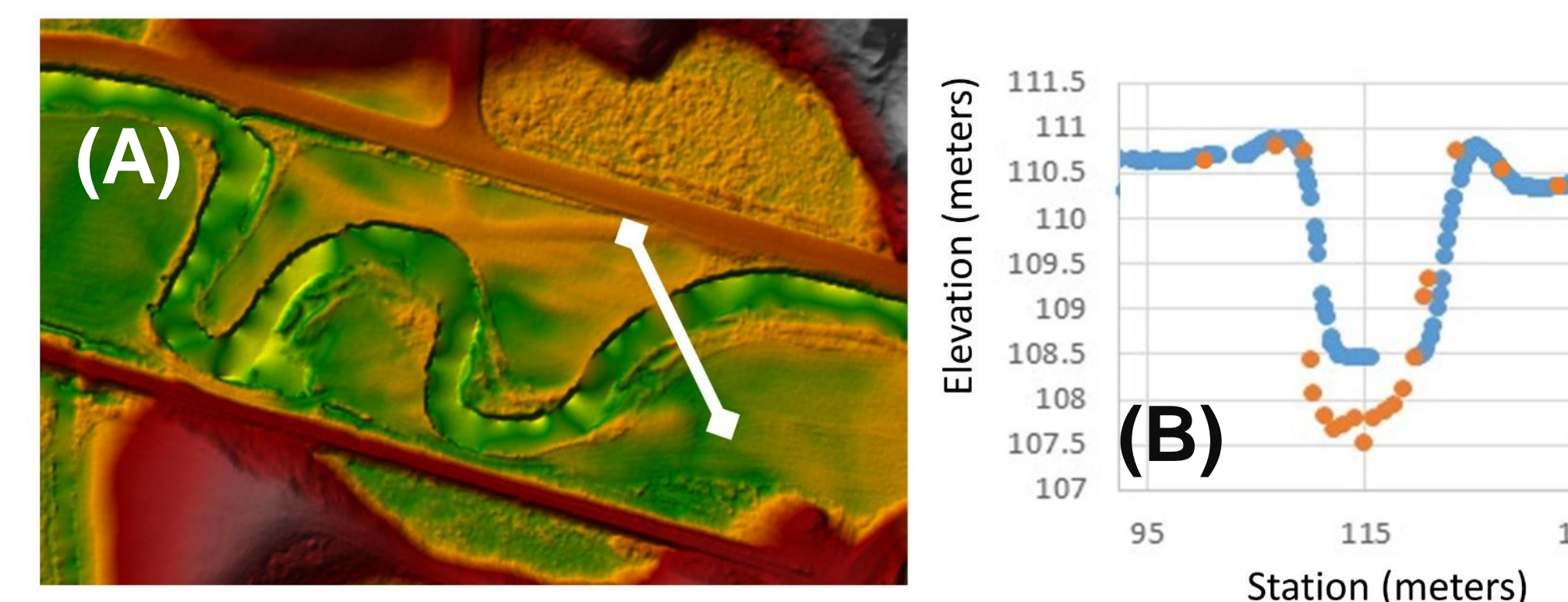
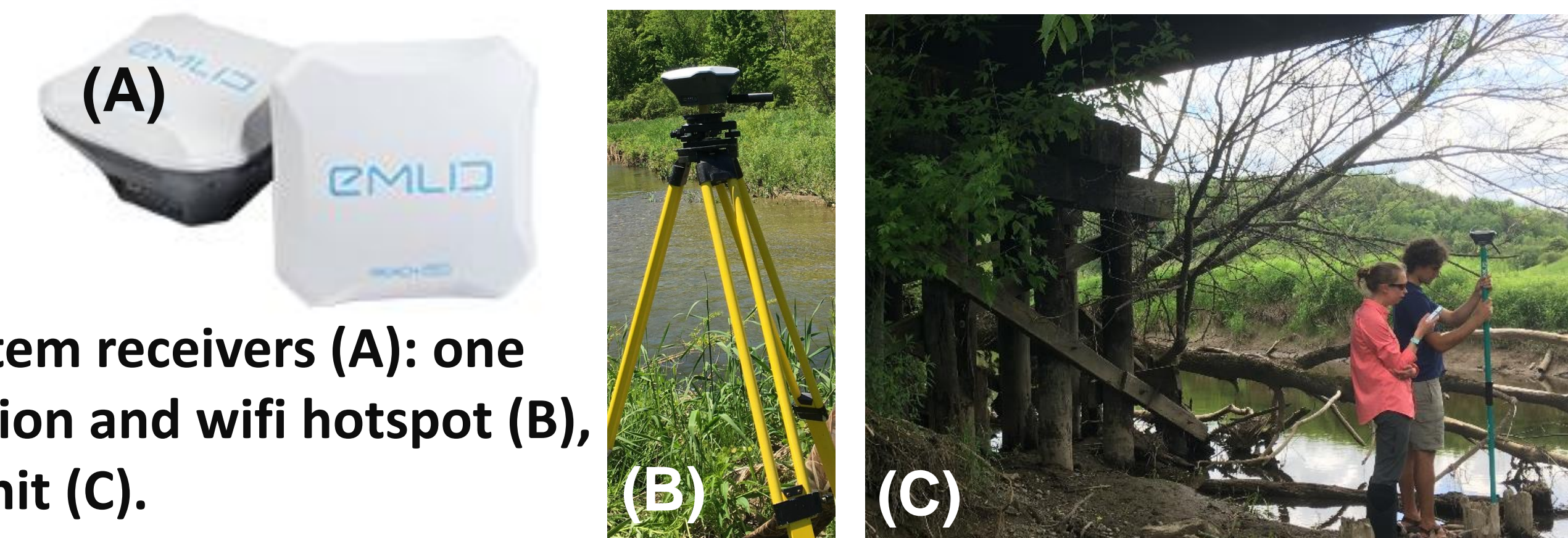


Figure 4. UVM Spatial Analysis Laboratory performed hydroflattening of the 2017 lidar-derived DEMs (A), and field survey data were applied (B, orange dots) to update bathymetry at each section.

Interpolated channel bathymetry will be merged with the 2017 lidar-derived digital elevation model for the study area within the hydraulic model.

Future Work

(1) Model simulations of floodplain reconnection scenarios, (2) a protocol to identify and prioritize floodplain reconnection sites statewide, and (3) training sessions to share project findings with stakeholders.

Acknowledgments

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